भारतीय मानक
Indian Standard

IS 17295 : 2019

रबड़ एवं संबद्ध उद्योगों के लिए पेट्रोलियम आधारित अल्प पी ए एच प्रक्रिया एवं विस्तारक तेल

Petroleum Based Low PAH Process and Extender Oils for Rubber and Allied Industries

ICS 83.040.20

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भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

November 2019 **Price Group 2**

Rubber and Rubber Products Sectional Committee, PCD 13

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Rubber and Rubber Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

The global market place is increasingly demanding low PAH (Polycyclic Aromatic Hydrocarbon) process oils to reduce the health and environmental impact of rubbers and rubber products like tyres. Such low PAH process oils are produced by manufacturers using different refining techniques. Existing Indian Standard IS 15078 for petroleum based rubber process oils does not fulfill the requirements of new generation petroleum based low PAH process and extender oils. Use of low PAH rubber process oils is aggressively being sought after by developed and developing countries to meet their enhanced local regulations and hence these oils are required to be used by organizations exporting products to those countries. Indian tyre industry and other industries are already using these oils, therefore, there is a requirement to have a new standard covering these oils.

The composition of the Committee responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*).' The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PETROLEUM BASED LOW PAH PROCESS AND EXTENDER OILS FOR RUBBER AND ALLIED INDUSTRIES

1 SCOPE

This Indian Standard covers specification for various new process/extender oils named as low PAH oils, use by rubber and allied industries. This specification, besides defining normal physico-chemical parameters for process and extender based oils, exclusively covers the PAH content requirements.

2 REFERENCES

The following Standards contain provision which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on the standard are encouraged to investigate the possibility of applying the most recent editions of the standards:

IS No./ Other Publication	*Title*
1070 : 1992	Reagent grade water — Specification (*third revision*)
1448	Methods of test for petroleum and its products
[P : 3] : 2007/ ISO 2977 : 1997	Petroleum products and hydrocarbon solvents — Determination of aniline point and mixed aniline point (*third revision*)
[P : 10/Sec 2] : 2013/ ISO 3016 : 1994	Cloud point and pour point, Section 2 Determination of pour point (*second revision*)
[P : 16] : 2014/ ISO 3675 : 1998	Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method (*fourth revision*)
[P : 25] : 1976	Determination of kinematic and dynamic viscosity (*first revision*)
[P : 33] : 1991	Sulphur by bomb method
[P : 69] : 2013/ ISO 2592 : 2000	Determination flash and fire points — Cleveland open cup method (*first revision)*
7086 (Part 1) : 1973	Methods of sampling and test for rubber compounding ingredients
EN 16143 : 2013	Determination of content of benzo(a)pyrene (BaP) and selected polycyclic hydrocarbons (PAH) in extender oils — Procedure using double LC cleaning and GC/MS analysis

3 TYPES

3.1 To meet the low PAH requirement, oil industries developed new types of low PAH process and extender oils by using different unique technologies.

3.2 Based on different technologies, Low PAH process and extender oils for rubber and allied industries are classified below:

a) Treated Distillate Aromatic Extract (TDAE);
b) Residual Aromatic Extract (RAE);
c) Treated/Safe Residual Aromatic Extract (TRAE/SRAE);
d) Mildly Extracted Solvate (MES);
e) Naphthenic Oil Light (NAP); and
f) Naphthenic Black Oil (NBO).

4 REQUIREMENTS

4.1 Description

The material shall be uniform and free from foreign matter and other impurities.

4.2 The material shall comply with the requirements given in Table 1

5 PACKING AND MARKING

5.1 Packing

The material shall be packed in containers agreed to between the purchaser and the supplier.

5.2 Marking

5.2.1 Each container shall be marked with the following:

a) Name and grade of the material;
b) Indication of the source of manufacture;
c) Net mass of the material;
d) Month and year of the manufacture; and
e) Lot/batch number.

5.2.2 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act,* 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.'

6 SAMPLING

6.1 Representative samples of the material shall be drawn as prescribed in IS 7086 (Part 1).

6.2 Number of Tests

Tests for all characteristics of process oils given in Table 1 shall be conducted on individual samples.

6.3 Criteria for Conformity

Lot shall be declared as conforming to the requirements of the specification if all the test results on the individual test samples satisfy the corresponding requirements.

7 TEST METHODS

7.1 Tests shall be conducted according to the methods prescribed in relevant Indian Standard specifications which is given in Table 1.

7.2 Quality of Reagents

Unless otherwise specified 'pure chemicals' and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

Table 1 Requirements for Petroleum Based Low PAH Process and Extender Oils for Rubber and Allied Industries

(*Clauses* 4.2 and 7.1)

Sl No.	Characteristic	Requirements						Method of Test
		TDAE	RAE	TRAE/ SRAE	MES	NAP	NBO	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	Appearance	Dark	Dark	Dark	Dark	Pale Yellow to Dark	Pale Yellow to Dark	Visual
ii)	Density @ 15°C	0.90 - 0.98	0.90 - 1.02	0.90 - 0.99	0.88 - 0.96	0.89 - 0.95	0.94 – 0.96	IS 1448 [P : 16]
iii)	Kinematic viscosity @100°C, cSt	12 - 31	40 - 90	22 - 36	13 - 22	3.5 - 21	26 - 32	IS 1448 [P : 25]
iv)	Flash point (COC) °C, *Min*	210	220	220	220	150	210	IS1448 [P : 69]
v)	Aniline point °C	60 - 80	45 - 80	70 - 95	85 - 100	65 - 97	87 - 97	IS 1448 [P : 3]
vi)	Pour point °C, *Max*	51	48	42	9	-12	-9	IS 1448 [P : 10]
vii)	Sulphur, Weight percent, *Max*	5.0	6.5	4.5	3.0	1.0	1.0	IS 1448 [P : 33]
viii)	Benzo(a)pyrene (BaP), ppm, *Max*	← 1.0 →						EN 16143
ix)	Sum. of listed PAH**, ppm, *Max*	← 10.0 →						do

NOTES:

1 The acceptance value and tolerance of all parameters shall be as agreed to between purchaser and the manufacturer, however acceptance value shall be within the requirement range in Table 1.

2 Following properties to be reported:

a) Carbon Aromatic (C_A), Carbon Paraffinic (C_P), Carbon Naphthenic (C_N) percent weight
b) Glass Transition Temperature, °C

(*) - EN 16143 test method to be used till corresponding IS test method is developed.

(**) - Listed PAH- Benzo(a)anthracene; Chrysene; Benzo(b) fluoranthene; Benzo(j))fluoranthene; Benzo(k))fluoranthene; Benzo(e)pyrene; Benzo(a)pyrene; Dibenzo(a,h)anthracene;

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Rubber and Rubber Products Sectional Committee, PCD 13

Organization	*Representative(s)*
The Rubber Board, Kottayam	Dr James Jacob Dr Siby Varghese (*Alternate*)
Dow Corning India Pvt Ltd	Shri Subhranshu Gupta
Export Inspection Council of India	Shri K. J. Srivastav
Flame Retardants Association of India, Gurgaon	Shri P. V. Murali Mohan
GRP Limited, 510, 'A' Wing, Kohinoor City Commercial – 1, Kirol Road, off L.B.S. Marg, Landmark-Opp Don Bosco School Kurla (West), Mumbai. Maharashtra	Shri Kalyan Das
Hasetri, Jaykagram PO: Tyre Factory Dist Rajsamand, Kankroli 313342, Rajasthan	Shri Saikat Das Gupta
Hindustan Latex Limited Lifecare Limited	Dr A. G. Shankaran
In Personal Capacity	Dr Arup K. Chandra
In Personal Capacity	Dr Sunny Sebastian
Indian Rubber Mfrs Research Association, Mumbai	Dr Bharat Kapgate (*Alternate*)
IRMRA	Dr K Raj Kumar
KA Pre Vulcanized Tamil Nadu	Shri Praveen Mathew (Director) Shri K. K. Thakur (*Alternate*)
LPG Equipment Research Centre, Bangalore	Shri A. Krishna Kutty
Ministry of Defence (DGQA), New Delhi	Shri S. K. Saxena Shri V. K. Chhabra (*Alternate*)
Personal Capacity	Dr Ranjit Mathhan
All India Rubber Industries Association, Mumbai	Mr Srikanth Krishnamurthy Shri Chinmoy Ray (*Alternate*)
Association of Planters Kerala	Santosh Kumar Shri Philip C. Jacob (*Alternate*)
Automotive Tyres Manufacturers Association (ATMA), New Delhi	Mr Rajiv Budhraja Mr Vinay Vijayvargia (*Alternate*)
Block Rubber Processor's Association of India	Shri Rajiv Tharian Shri Ronny Joseph (*Alternate*)
Indian Oil Corporation R&D Centre – Faridabad – Haryana	Dr Deepak Saxena Dr Pankaj Bhatnagar (*Alternate*)
Indian Synthetic Rubber Private Limited (ISRPL)	Mr Lalit Kumar Sharma Mr Bhanu Pratap Singh (*Alternate* I) Mr Tuhin Kanti Das (*Alternate* II)
MRF Tyres	Mr B. Jayamani Mr G. Shyju (*Alternate*)
Newage Fire Protection Industries Pvt Ltd	Shri Bharat J. Shah Shri Jayant Sinha (*Alternate*)
Rado Industries Limited Faridabad	Shri P. C. Gupta Shri Kailash Gupta (*Alternate*)

Organization	*Representative(s)*
Reliance Industries Ltd (Elastomers Business), Vadodara	SHRI BHARAT B. SHARMA SOUMITRA CHATTRJEE(*Alternate*)
Research, Designs & Standards Organization, Lucknow	SHRI MNJESH KUMAR SHRI RAVI PRAKASH (*Alternate*)
Shri Sati Rubber Industries, Jaipur	SHRI VIJAY KUMAR AGARWAL SHRI SUDHIR AGARWAL (*Alternate*)
Voluntary Organization in Interest of Consumer Education (Voice), New Delhi	SHRI M. A. U. KHAN SHRI H. WADHWA (*Alternate*)
BIS Directorate General	SHRI V. K. DIUNDI, SCIENTIST 'G' AND HEAD (PCD) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary

SHRI CHANDRAKESH SINGH
SCIENTIST 'C' (BIS)

Bureau of Indian Standards

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:

		Telephones
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	2323 7617 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700054	2337 8499, 2337 8561 2337 8626, 2337 9120
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg CHANDIGARH 160019	265 0206 265 0290
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	2254 1216, 2254 1442 2254 2519, 2254 2315
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